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明 細 書

1. 発明の名称

創傷被覆材

2. 特許請求の範囲

通気性及び吸水性を有する不織布と、

該不織布の一面に貼合され、抗菌剤を含有する  
と共に撥水性を有する熱可塑性樹脂が塗着された  
編地と

によって構成され、伸長率が縦横両方向共に20  
～100%の範囲で、伸長回復率が縦横両方向共  
に60%以上であることを特徴とする創傷被覆材。

3. 発明の詳細な説明

(産業上の利用分野)

本発明は熱傷、褥瘡(床ずれ)その他外傷によ  
る創傷の治療に好適な創傷被覆材に関する。

(従来技術)

従来より熱傷、褥瘡(床ずれ)その他外傷によ  
る創傷を治療するための創傷被覆材として、例え

ば比較的吸水性や通気性が良く、創傷面において  
蒸れに防止効果のある不織布に、細菌感染の防止  
等のための抗菌剤を含有する軟膏を塗布したもの  
があった。

ところがこの場合だと、①使用するときには  
いち不織布面に軟膏を塗布しなくてはならず面倒  
である。②第8図に示す如く、創傷面に貼付した  
創傷被覆材(110)を剥すときに、この創傷面に折  
角新しく形成した生体組織が同被覆材(110)表面  
に付着したまま剥されてしまうという欠点があっ  
た。

そこで、上記欠点に鑑み以下(7)又は(イ)の創  
傷被覆材が提案された。

(7) 不織布に抗菌剤等の薬剤を予め付与したも  
の。

(イ) 不織布の一面に抗菌剤を含有するフィルム  
を貼合したもの。

(発明が解決しようとする課題)

しかしながら、上記(7)の創傷被覆材においては、使用するときにはいちいち軟膏を塗布するという面倒はないものの、創傷面との離型性に劣り創傷面に貼付した同創傷被覆材を剥すときに新しく形成した生体組織が付着したまま剥されるという欠点は依然解消されなかった。

また、上記(1)の創傷被覆材においては、不織布の一面に抗菌剤等を含有するフィルムが貼合されているので、創傷面における血液、滲出液等(以下体液という)が浸出するのを抑制する効果はあるものの、(a)通気性に劣る。(b)不織布の伸縮性が阻害され易いので創傷面の動きに追従できず、第9図に示す如く同被覆材(120)が創傷面から剥がれるという欠点があった。

そこで案出したのが本発明であり、その目的とするところは、創傷面との離型性が良く、かつ創傷面の動きに対応する伸縮性と、通気性及び吸水性を有すると共に抗菌効果をもつ創傷被覆材を提

— 3 —

抗菌剤を含有すると共に撥水性を有する熱可塑性樹脂が塗着された編地(20)が貼合されていて、この創傷被覆材(100)の編地(20)側を創傷面にくるように貼付すると、同創傷面における余分の体液が吸水性を有する不織布(10)に吸収されると共に編地(10)の抗菌剤により細菌感染や増殖を抑制する。

また編地(20)は、撥水性を有する熱可塑性樹脂が塗着しているので創傷面において撥水性を有し、従って離型性が良いので同創傷被覆材(100)を創傷面から剥すときに同創傷面に新しく形成した生体組織等が同創傷被覆材(100)に付着しない。

そして、創傷被覆材(100)は、伸長率が縦横両方向共に20～100%の範囲で、伸長回復率が縦横両方向共に60%以上と高いので創傷面の動きに対応して伸縮し易い。さらに、通気性を有するので創傷面において蒸れない。

(実施例)

— 5 —

供することにある。

(課題を解決するための手段)

上記の目的を達成するための本発明の構成を実施例に対応する図面に基づいて説明する。

即ち、

通気性及び吸水性を有する不織布(10)と、

該不織布の一面に貼合され、抗菌剤を含有すると共に撥水性を有する熱可塑性樹脂が塗着された編地(20)と

によって構成され、伸長率が縦横両方向共に20～100%の範囲で、伸長回復率が縦横両方向共に60%以上であることを特徴とする創傷被覆材(100)

を内容とする。

(作用)

上記手段により本発明に係る創傷被覆材(100)においては、

通気性及び吸水性を有する不織布(10)の一面に、

— 4 —

以下、第1図～第7図について本発明の実施例を説明するが、これは良いと思われる代表的なものを示したものであり、本実施例によって本発明が限定されるものではない。

まず、第1図～第3図に示す如く、本発明の実施例に係る創傷被覆材(100)は、ポリエステル繊維とレーヨン繊維とより成る不織布(10)と、この一面に貼合したスルファジアジン銀より成る抗菌剤を含有すると共にシリコン系樹脂とウレタン系樹脂との混合物から成る熱可塑性樹脂が塗着した網目状の編地(20)とによって構成してある。

この場合不織布(10)と編地(20)との貼合については、不織布(10)又は前記熱可塑性樹脂がすでに塗着した編地(20)のうち少なくともいずれか一方の片面に接着剤を塗布し、これらを貼合して接着させる方法を採用すれば良い。

またそれ以外に前記熱可塑性樹脂を編地(20)に含浸させ、水分を必要量だけ除去した後、これに

— 6 —

不織布(10)を重ね合わせ、さらに加熱処理して編地(20)と不織布(10)とを接着させる方法を採用しても良い。

この不織布(10)については、創傷面における蒸れ防止のために通気性に優れるものが望ましく、また、前記ポリエステル繊維とレーヨン繊維以外の繊維から成るものであっても良いが、創傷面における体液を吸収し易いものが望ましい。また、編地(20)については、ポリエステル系、ポリアミド系、ポリオレフィン系等の合成繊維を採用すればよい。

ここで、本実施例に係る創傷被覆材(100)の通気量をJIS L-1096-6-271A法により測定したところ $1.42 \text{ cc/cm}^2/\text{sec}$ であった。

前記抗菌剤については、緑膿菌、エンテロバクター属、クレブシエラ属、ブドウ球菌属等に対して抗菌効果のあるスルファジアジン銀を使用しているが、それ以外であっても良い。

— 7 —

表

成 分	重 量 %
シリコン系樹脂	2 . 0
ウレタン系樹脂	1 0 . 0
抗菌剤	1 . 0
架橋剤	0 . 7
触 媒	0 . 3
水	8 6 . 0

この創傷被覆材(100)は、伸長率が縦横両方向共に20～100%の範囲で、伸長回復率が縦横

次に前記熱可塑性樹脂については、シリコン系樹脂のみであっても良いし、またウレタン系樹脂以外の樹脂が混合されたものでも良いが、撥水性、伸縮性等を有することを目的とする本発明の趣旨からいって、より高い撥水性、伸縮性を有するものが望ましい。

また、本発明に係る創傷被覆材(100)においては、不織布(10)に抗菌剤を含有したものを採用すると、抗菌効果がより向上するので都合が良い。

このような観点から上記樹脂を含む成分及びその重量%については、以下の表に示すものを採用した。

(以下、余白)

— 8 —

両方向共に60%以上に成るようにしてあるが、その理由を以下に述べる。まず、伸長率が20%以下では同伸長率が低すぎて創傷面に貼付した同創傷被覆材(100)がこの創傷面の動きに対応して伸び難く、スムーズに動けない。特にひじ、ひざ等に貼付した場合は、その動きが大きいかつ頻繁なので創傷被覆材(100)がその動きに追従できずに創傷面より剥がれてしまう。また伸長率が100%以上では、逆に同伸長率が高すぎて創傷被覆材(100)の製造工程におけるドラフト調整が困難であるということと、同創傷被覆材(100)が前記製造工程において伸ばされすぎて不具合が発生するからである。

次に創傷被覆材(100)の伸長回復率が60%以下では、同回復率が低すぎて折角創傷面の動きに追従して伸びても回復せずに伸びたままになった部分が多く、そしてそれが弛んでしわに成るためそのしわの部分が創傷面と接触できず、従って創

傷被覆材(100)の機能が十分発揮できなくなるからである。

尚、本発明に係る創傷被覆材(100)を製造する場合について以下に詳述する。つまり第6図に示す如く、前記抗菌剤を含有する前記熱可塑性樹脂の貯留槽(40)の中に編地の送出機(30)より給送した編地を通過させてこの編地に同樹脂を含浸する。次いで、これを図には表れない公知のマングルで絞って同樹脂の付着量及び水分量を調整する。次いでこれを加熱による第1乾燥機(50)にて乾燥すると共に熱処理をして同樹脂を編地に塗着させる。そして、不織布の送出機(60)より給送した同不織布の一面に接着剤の塗布機(70)にて接着剤を塗布し、これを貼合機(80)に給送する。次いでこれを第1乾燥機(50)を経てきた編地と貼合した後、これを加熱による第2乾燥機(90)に給送して乾燥する。

また前記熱可塑性樹脂に、編地と不織布とを仮

— 11 —

①構成要素の1つである編地に、撥水性を有する熱可塑性樹脂が塗着しているので創傷面において撥水性を有し、同創傷面との離型性が良く、従って、この被覆材を剥すときに、創傷面において形成した生体組織等が同被覆材に付着したまま剥がれることを防止する。

②伸縮性が良いので創傷面に貼付したときに創傷面の動きに対応し易いのでスムーズに動ける。

③構成要素の1つである不織布が通気性を有するので、創傷面に貼付しても蒸れない。

④同不織布が吸水性を有するので創傷面における余分の体液を吸収し、従って創傷面を清潔に保ち易い。

⑤前記編地に、抗菌剤を含有する熱可塑性樹脂が塗着しているので創傷面における細菌による感染や増殖を抑制する。

#### 4. 図面の簡単な説明

第1図は本発明の実施例に係る創傷被覆材の斜

接着できる程度の接着剤が混合してあれば、前記接着剤の塗布機(70)と第1乾燥機(50)は不要となり、従って第7図に示す如く第6図に示すものと比較して工程を簡略化できる。

このようにして得られた本発明に係る創傷被覆材(100)は、第5図に示す如く、ひじに貼付して頻繁に動かしてもスムーズに動き、創傷面から剥がれてしまうこともなかった。また、この創傷被覆材(100)を創傷面に貼付してこれを1日後、3日後、5日後に各々剥したところ、第4図に示す如く、いずれにおいても創傷面からきれいに剥がれ、生体組織の同創傷被覆材への付着は確認されなかった。さらに、創傷面において化膿等の症状もみられなかった。

(発明の効果)

以上説明した通り、本発明によると以下の効果を奏する。

つまり、本発明に係る創傷被覆材においては、

— 12 —

視図、第2図は同創傷被覆の構成要素の1つである編地の斜視図、第3図は同不織布の斜視図、第4図は本発明の実施例に係る創傷被覆材を創傷面から剥した状態を示す拡大正面図、第5図は同創傷被覆材をひじに貼付した状態を示す縮小斜視図、第6図は本発明に係る創傷被覆材を製造する工程の一実施例を示すブロック図、第7図は別の実施例を示すブロック図、第8図は従来の創傷被覆材を創傷面から剥した状態を示す拡大正面図、第9図は別の従来の創傷被覆材をひじに貼付した状態を示す縮小斜視図である。


#### 符 号 の 説 明

10…不織布、20…編地、100…本発明の実施例に係る創傷被覆材。

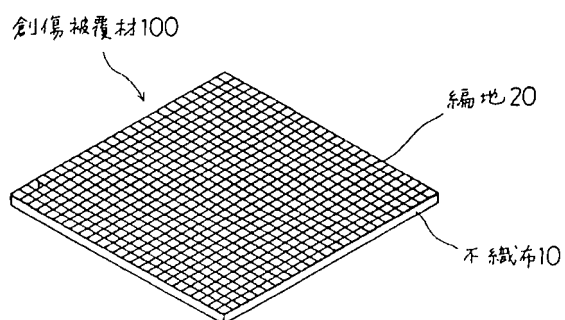
特許出願人

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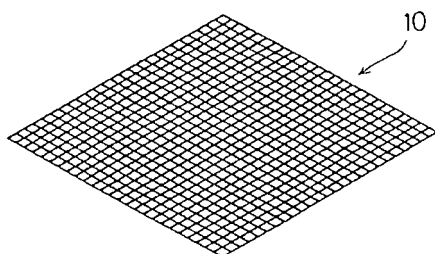
代 理 人

弁 理 士 後 藤 昌 弘 

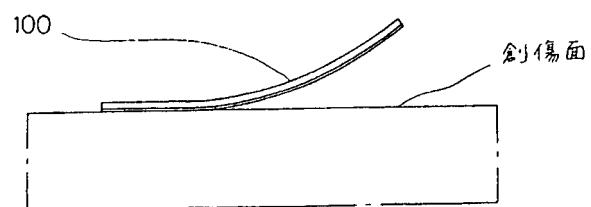
第 1 図



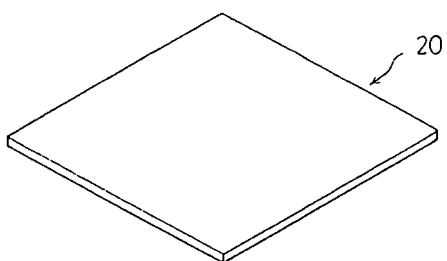
第 2 図



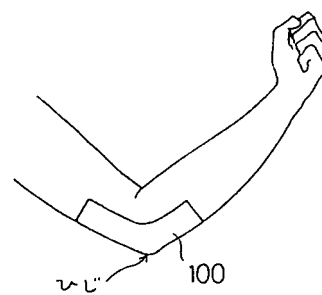
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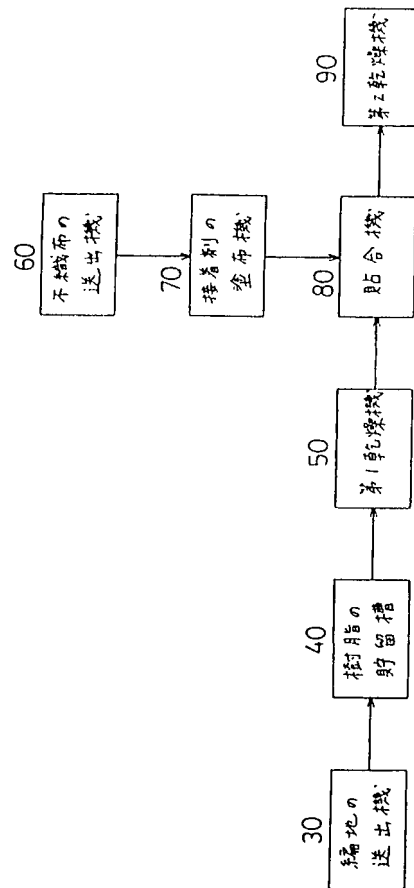
第 3 図



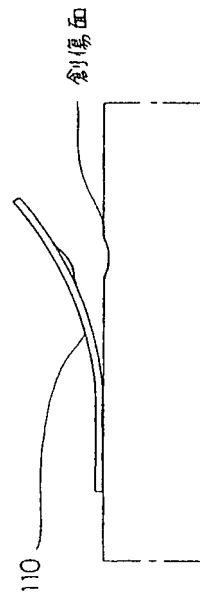
第 5 図



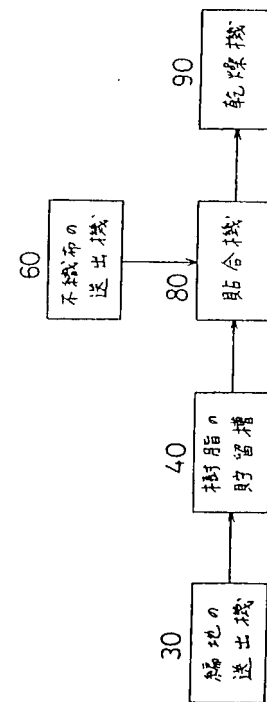
第 6 図



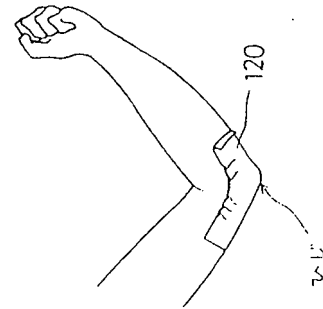
第 8 図



第 7 図



第 9 図



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(54) TITLE OF THE INVENTION

Wound cover material [Soshoo hifukuzai]

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[Amendments: There are no amendments attached to this patent. Translator's note]

[Note: All names, addresses, company names, and brand names are translated in the most common manner. Japanese language does not have singular or plural words unless otherwise specified with numeral prefix or general form of plurality suffix. Translator's note]

## SPECIFICATION

### 1. TITLE OF THE INVENTION WOUND COVER MATERIAL

### 2. CLAIMS

A wound cover material is characterized by the fact that it is composed of a nonwoven cloth having gas permeability and water absorption property, a knitting fabric that is pasted to one plane of said nonwoven cloth and includes anti-bacterial agent in addition to being coated and adhered with a thermoplastic resin showing water repellency; and stretch rate in both directions of length and breadth is within a range of 20 ~ 100%, and stretch recover rate is 60% or more in both directions of length and breadth.

### 3. DETAILED EXPLANATION OF THE INVENTION (FIELDS OF INDUSTRIAL APPLICATION)

This invention relates to a wound material suited for treatment of burns, decubitus (bed sore) and wound caused by other injuries.

#### (PRIOR ART)

As to the wound cover material for purpose of treating burns, decubitus (bed sore), and wound caused by other injuries, for instance, the one on which nonwoven cloth showing a fairly good water absorption property or gas permeability and displays preventive effect against molding on a wound surface, an ointment that includes anti-bacterial agent for purpose of preventing from bacterial infection is coated has been made available.

However, this has been known to display such defects as (1) it is necessary to coat an ointment on a nonwoven cloth plane at each time of use that is cumbersome, and (2) as illustrated in the Figure 8, when peeling wound cover material (110) that is pasted on a wound surface, vital tissue that a newly formed on this wound surface can be also peeled while being adhered to the surface of said cover material (110).



And therefore, wound cover material of (A) or (B) explained below was proposed based on above-explained defects.

- (A) A nonwoven cloth to which a drug such as anti-bacterial agent and the like has been applied beforehand,
- (B) a film including anti-bacterial agent is pasted on one plane of nonwoven cloth,

#### (SUBJECTS SOLVED BY THIS INVENTION)

However, according to the wound cover material of above-explained (A), although it does not require a cumbersome coating of ointment at each time of use, it shows poor release property from the wound surface, and defect of peeling newly formed vital tissues that is adhered when peeling said wound material that is pasted on a wound surface remains yet to be solved.

In addition, according to the wound cover material of above-explained (B), because film that includes anti-bacterial agent is pasted on one plane of nonwoven cloth, although it may show an effect of controlling effusion of blood or exudates and the like (this will be hereafter referred to as body fluid) on the wound surface, it shows such defects as (a) lacks gas permeability, (b) as illustrated in the Figure 9, it cannot follow the movement of the wound surface as stretch property of the nonwoven cloth is easily inhibited, and said cover material (120) peels from the wound surface.

And therefore, this invention was devised; and its purpose is to offer a wound cover material that shows a good release property from a wound surface and shows stretch property that corresponds to the movement of wound surface, gas permeability, and water absorption property, and at the same time, shows an anti-bacterial effect.

#### (MEANS USED TO SOLVE THE SUBJECTS)

This invention's structure that attains above-explained purpose is explained based on the Figures that correspond to examples.

That is to say, its content is based on the wound cover material (100) that is characterized by the fact that is composed of a nonwoven cloth (10) with gas permeability and water absorption property, and a knitting fabric (20) that is pasted on one plane of said nonwoven cloth and includes anti-bacterial agent and shows water repellency; and stretch rater in both directions of length and breadth is within a range of 20 ~ 100%, and stretch recovery rate in both directions of length and breadth is 60% or more.

#### (ACTIONS)

According to the wound cover material (100) that relates to this invention through above-explained means, a knitting fabric (20) with a thermoplastic resin that shows water repellency that is coated and adhered and includes anti-bacterial agent is pasted on one plane of nonwoven cloth (10) showing gas permeability and water repellency; and when knitting fabric side (20) of this wound cover material (100) is pasted on a wound surface, excess body fluid on said wound surface is absorbed by the nonwoven cloth (10) that shows water absorption property, and at the same time, bacterial infection or propagation can be controlled by the anti-bacterial agent of the knitting fabric (10).

In addition, because knitting fabric (20) [note: original document states knitting fabric (20), not knitting fabric (10), translator's note] is coated with a thermoplastic resin showing water repellency, it shows water repellency on the wound surface, and therefore, it shows a good release property, and when said wound cover material (100) is released from the wound surface, newly formed vital tissues and the like on said wound surface would not become adhered to said wound cover material (100).

In addition, as wound cover material (100) shows stretch rate in both directions of length and breadth of within a range of 20 ~ 100%, and stretch recovery rate in both directions of length and breadth being as high as 60 % or more, it easily stretches in correspondence with the movement of wound surface. Furthermore, as it shows gas permeability, it does not display molding on the wound surface.

#### (EXAMPLES)

This invention's example is explained below based on Figure 1 ~ Figure 7; and this is a representation that is considered to be as good, and this invention should not be limited by this example.

First of all, as illustrated in the Figure 1 ~ Figure 3, the wound cover material (100) that relates to the example of this invention is composed of a nonwoven cloth (10) comprising polyester fibre and Rayon fibre on which one plane is pasted with a knitting fabric (20) of mesh form that contains anti-bacterial agent of sulfadiazine silver and at the same time, it is coated and adhered with a thermoplastic resin comprising a mixture of silicon group resin and urethane group resin.

In this case, regarding pasting of nonwoven cloth (10) and knitting fabric (20), it can be done by a method that coats an adhesive agent on at the least one side of nonwoven cloth (10) or knitting fabric (20) already coated with said thermoplastic resin to be pasted to adhere.

In addition, it is all right to use a method that first impregnates said thermoplastic resin on a knitting fabric (20), and removes moisture at the rate needed, and piles nonwoven cloth (10) on this and subjects this to a heat treatment to adhere knitting fabric (20) and nonwoven cloth (10) besides above-explained method.

Regarding this nonwoven cloth (10), the one that shows excellent gas permeability is preferable for purpose of prevention against molding on a wound surface; and in addition, it is all right when the fibre consist of other than said polyester fibre and Rayon fibre, and the one that easily absorbs body fluid on a wound surface is preferable. In addition, regarding knitting fabric (20), synthetic fibre of polyester group, polyamide group, or polyolefin group and the like may be used.

At this time, when gas-permeability of the wound cover material (100) that relates to this example was measured in accordance with JISL-1096-6-271 A method, it was 142 cc/cm<sup>2</sup>/sec.

Regarding said anti-bacterial agent, sulfadiazine silver that shows anti-bacterial effect against pseudomonas aeruginosa, enteropowder group [note: although the original document states enteropowder, it may be a misprint of enterobacter, translator's note], kurenosherra group [note: although the original document states kurenosherra, it may be a misprint of klebsiella, translator's note]; or staphylococci group and the like; and it is all right when other agents are used.

Then, regarding said thermoplastic resin, it may be of silicon group only, or it is all right when resins other than urethane group resin are mixed; and the one showing higher water repellency and stretch property is preferable from the standpoint of this invention's intent on targeting water repellency or stretch property and the like.

In addition, regarding wound cover material (100) that related to this invention, when the one that includes anti-bacterial agent in a nonwoven cloth (10) is chosen, it further improves anti-bacterial effect, and is convenient.

Based on these standpoint, the ones that are shown in the Table below were chosen as components including above-explained resin and its weight %.

Table

Components	Weight %
Silicon group resin	2.0
Urethane group resin	10.0
Anti-bacterial agent	1.0
Corsslinking agent	0.7
Catalyst	0.3
Water	86.0

This wound cover material (100) is designed to show stretch rate in both directions of length and breadth to be within a range of 20 ~ 100%, and stretch recovery rate in both directions of length and breadth to be 60% or more; and reasons for setting that way are explained below. First of all, when stretch rate happens to be 20% or under, said stretch rate becomes too low and said wound cover material that is pasted on a wound surface shows difficulty in stretching in correspondence with the movement of wound surface, and it does not display a smooth movement. In particular, when it is pasted on elbow or knee and the like, that movement is large as well as frequent, and wound cover material (100) cannot follow such movement and peels from the wound surface. In addition, when stretch rate happens to be 100% or more, this stretch rate becomes too high on a contrary, and draft adjustment during manufacturing process of wound cover material (100) becomes difficult, and at the same time, said wound cover material (100) is stretched too much during said manufacturing process to cause inconveniences.

Then, when stretch recover rate of the wound cover material (100) happens to be lower than 60%, said recovery rate remains too low and even though it may successfully follow the movement of wound surface, it does not recover and often remains stretched; and that portion becomes slacked causing wrinkles to result in that wrinkle portion not contacting with the wound surface; and therefore, it cannot sufficiently display the function as a wound cover material (100).

Furthermore, manufacturing of wound cover material (100) that relates to this invention is explained in details below. That is to say, as illustrated in the Figure 6, knitting fabric is fed from a let-off device of knitting fabric into a vessel (40) that holds thermoplastic resin that includes said anti-bacterial agent to impregnate said resin in this knitting fabric. Then, this is wrung with already known mangle not shown in the Figure to adjust adhesion rate of said resin and moisture rate. Then, this is dried through the first dryer (50) by heating, and at the same time, this is heat treated to coat and adhere said resin on the knitting fabric. Then, on one plane of said nonwoven cloth fed by a let-off machine (60) of the nonwoven cloth is coated with an adhesive agent with a coating machine (70) of adhesive agent; and this is fed to a pasting machine (80). Then, after this is pasted with the knitting fabric that has gone through the first dryer (50), it is fed to the second dryer (90) by heating to be dried.

In addition, when said thermoplastic resin is mixed with an adhesive agent at such level that can temporarily adhere knitting fabric and nonwoven cloth, said coating machine (70) of adhesive agent and first dryer (50) are no longer required, and therefore, as illustrated in the Figure 7, process can be simplified in comparison to that illustrated in the Figure 6.

As illustrated in the Figure 5, the wound cover material (100) that relates to this invention and is given in above-explained manner can move smoothly with the frequent movement even when it is pasted on an elbow, and it showed no peeling from the wound surface. In addition, this wound cover material (100) was pasted on a wound surface, and when it was peeled off after 1 day, 3 days, and 5 days, it showed clean peel off from the wound surface in all cases as illustrated in the Figure 4 to confirm no adhesion of vital tissues to said wound cover material. Furthermore, a symptom such as purulence was not noted on the wound surface.

#### (EFFECTS OF THIS INVENTION)

The effects shown below are displayed by this invention as explained above:

That is to say, according to the wound cover material that relates to this invention, following effects are displayed:

- (1) Because thermoplastic resin that shows water repellency is coated and adhered on a knitting fabric that is one of the component element, it shows water repellency on a wound surface to provide good release property with the said wound surface; and therefore, when this cover material is peeled, it is possible to prevent from peel while the vital tissues and the like formed on the wound surface remain adhered.
- (2) Because of good stretch property, when it is pasted on a wound surface, it shows smooth movement as it can well correspond to the movement of wound surface.
- (3) Because nonwoven cloth that is one of the component element shows gas permeability, it does not cause molding even when it is pasted on a wound surface.
- (4) Because said nonwoven cloth shows water absorption, it absorbs excess body fluid on the wound surface, and therefore, it is easy to keep the wound surface clean.
- (5) Because said knitting fabric is coated and adhered with a thermoplastic resin that includes anti-bacterial agent, it controls infection or propagation of bacteria on the wound surface.

#### 4. BRIEF DESCRIPTION OF THE FIGURES

Figure 1 illustrates a diagonal view of wound cover material that relates to this invention's example; and Figure 2 illustrates a diagonal view of knitting fabric that is one of the component element of said wound cover material; and Figure 3 illustrates a diagonal view of said nonwoven cloth; and Figure 4 illustrates an enlarged frontal view that shows the state when wound cover material that relates to this invention's example is peeled from a wound surface; and Figure 5 illustrates a reduced diagonal view that shows the state when said wound cover material is pasted on an elbow; and Figure 6 illustrates a block diagram that shows one example of manufacturing process of wound cover material that relates to this invention; and figure 7 illustrates a block diagram of other example; and figure 8 illustrates an enlarged frontal view that shows when conventional wound cover material is peeled from a wound surface; and Figure 9 illustrates a reduced diagonal view that shows a state when other conventional wound cover material is pasted on an elbow.

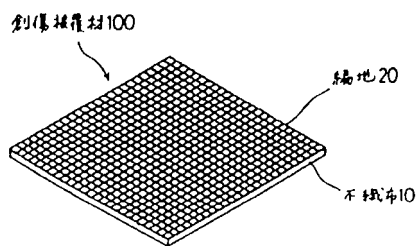
#### DESCRIPTION OF CODES

10: nonwoven cloth, 20: knitting fabric, 100: wound cover material that relates to this invention's example.

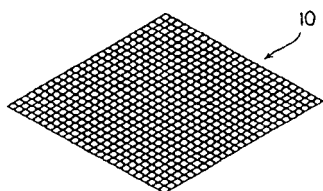
Figures 1 through 9

[I: Figure, A: wound surface, B: elbow, 10: nonwoven cloth, 20: knitting fabric, 30: let-off machine for knitting fabric, 40: vessel that holds resin, 50: first dryer, 60: let-off machine for nonwoven cloth, 70: coating machine of adhesive agent, 80: pasting machine, 90: second dryer, 100: wound cover material ]

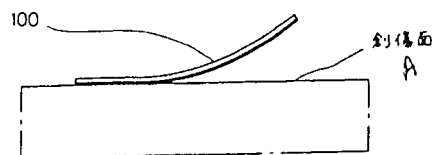
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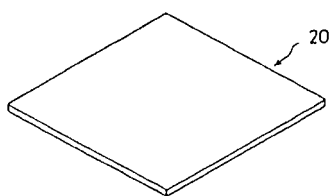
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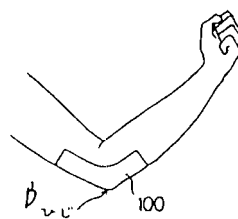
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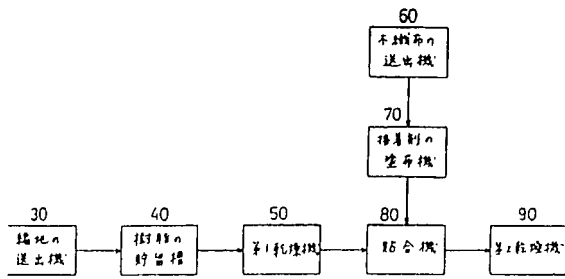
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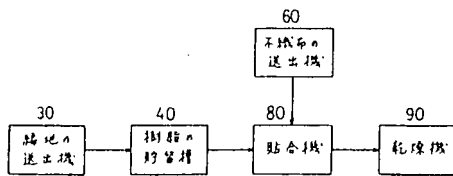
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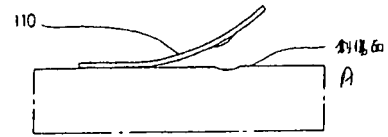
第 6 圖 1



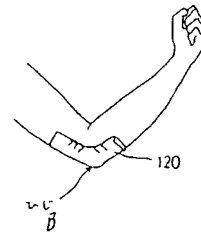
第 7 圖 1



第 8 圖 1



第 9 圖 1



Translation requested by: Lee Pavelka, Intellectual Property Liaison and Scott Burton,  
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